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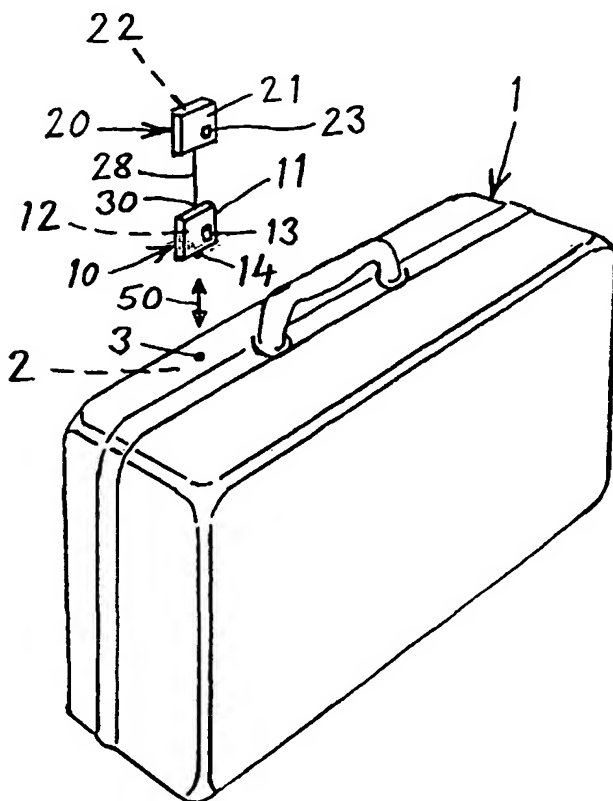
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[Continued on next page]

(54) Title: **METHOD FOR TRANSPORTING AN ALARMED CONTAINER**

(57) Abstract: The present invention relates to a method or process concerning the transportation of an alarmed container (1), particularly with regard to the transportation of valuable objects or valuable documents. The container (1) includes a first electronic unit (2) which functions to accept and permit deactivation and/or opening of the container, wherein the container is opened with the aid of a primary key (10) which includes a second electronic unit (12) that communicates with the first electronic unit (2) in respect of initiating opening of the container. The primary key (10) accompanies a person transporting the container (1) and the container is opened and/or its alarm system deactivated at its destination, with the aid of a code subset (AB) from the person-carried primary key (10) in co-action with a code subset (CD) obtained from a destination-located secondary key (20), therewith providing a total code-set (ABCD) required for initiating opening/deactivation of the container. When a transportation route (100) includes a number of delivery destinations/collection destinations (110, 120, 130), the secondary keys (20) having mutually varying code subsets are placed at said destinations, wherewith the aforesaid person-carried primary key (10) enables the container to be opened/deactivated in co-action with code subsets (CD, EF, GH) obtained from respective secondary keys (20) at respective destinations (110, 120, 130) over a chosen transportation route (100), for instance.

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**METHOD FOR TRANSPORTING AN ALARMED CONTAINER**

The present invention relates to a method concerning the transportation of an alarmed container in accordance with the preamble of the accompanying Claim 1. The invention also relates to an arrangement.

Containers or so-called security bags or cases used for the transportation of valuable objects or valuable documents, for instance, require the addition of a code-based opening procedure of a high security level.

Unfortunately, it is possible that a key by means of which the alarm system of the transportable container can be deactivated and/or the container opened will be stolen or come into wrong hands so that the alarm can be deactivated and/or the container opened at a geographical position other than that intended.

SE 0200169-1 teaches a solution to this problem that functions very efficiently in respect of fixed and regular delivery destinations.

However, the container may be collected and delivered along different temporary transportation routes, making it sometimes impossible to use a stationary, anchored second key (customer key/secondary key). It is also desired to be able to block the use of a lost customer key when considered necessary, without remaining customers along the transportation route being affected by the block, while, at the same time, obviating the need to change the coding of a first key (primary key) for this reason.

Accordingly, an object of the present invention is to provide a highly attractive and secure method or process that will, for instance, ensure that deactivation of the alarm system and/or the opening of a mobile/transportable container will be effected at the correct position along a transportation route. This object is

achieved with the method having the characteristic features set forth in the accompanying Claims.

Among those advantages afforded by the present invention can be mentioned that said method provides a very high security level and also economic advantages. Even though an unauthorised person should obtain access to a customer key/secondary key, deactivation and/or opening of the mobile container can be prevented, for example, by remote blocking of the relevant customer key. This will prevent effectively so-called insider crime, meaning that a lost key will not constitute a security risk. The primary key can still be used as normal.

The invention will now be described in more detail by way of example and with reference to the accompanying drawing, in which Fig. 1 is a schematic perspective view of a primary key, a secondary key and a transportable container in the form of a security bag or case; and Fig. 2 is a schematic illustration of a transportation route between a central station and three different destinations.

The transportation container 1 illustrated in Fig. 1 exemplifies a sealable storage space that can be opened and/or its alarm system deactivated via the action of a code. The illustrated transportation container 1 forms a security container/security cassette whose outer casing is equipped with an alarm system such that any attempt to make a hole in the casing or to bend the casing apart or any other irregular attempt to open the casing can be indicated. Located in the container 1 is a first electronic unit 2 and its requisite power source. The electronic unit 2 is designed to activate a destruction agent or the like in the container immediately a signal current circuit/alarm current circuit is broken, for instance, so as to destroy or bring influence to bear on the valuable contents of the container storage space at that moment in time. Activation and deactivation of the alarm electric circuit/alarm system and the electronic unit is effected by means of a suitable high security code system. The

aforescribed transportation container 1 may be used for the transportation of valuable objects between different places/destinations, wherewith after having placed valuable objects in the container, such as banknotes, documents, computer disks, etc., the container 1 is closed and the alarm system activated prior to transportation of the container to its intended destination, whereafter the container is opened at the delivery destination on the basis of a code, by deactivating the alarm system at said destination with the aid of a key but allows the container 1 to be opened without activation of the destruction agent and therewith without the destruction of the container contents. The container can then be emptied and reloaded with further objects or documents and so on.

Also shown in Fig. 1 is a first key/primary key 10 which is designed to enable the mobile container 1 to be deactivated and/or opened in combination with a secondary key 20. The primary key 10 is encapsulated in an outer casing 11 which is provided with an alarm system that enables all types of unauthorised manipulation of the casing, such as an attempt to make a hole or to open the casing, to be indicated. The key casing 11 includes a second electronic unit 12 and possibly also a source of electric current. Any attempt to force a hole in the casing or to open said casing 11 will result in the destruction of the code content of the primary key 10. The primary key 10 may also include an operating button 13.

In order to enable the electronic unit 12 of the primary key 10 to be loaded with codes and possibly other information, there is provided an electric socket to which programming equipment can be connected temporarily. The key 10 also includes means 14 whereby the electronic unit 12 is able to communicate with the electronic unit 2 in the container 1 when necessary, for instance via electromagnetic waves (e.g. infrared light, so-called IR light).

To enable the electronic unit 2 of the container 1 to be loaded with codes and possibly other information, there is provided an

electric socket to which programming equipment may be connected temporarily. The container 1 also includes means 3, which enable the electronic unit 2 to communicate with the electronic unit 12 of the primary key 10 when necessary, for instance via  
5 electromagnetic waves (e.g. infrared light, so-called IR light).

The communication between the electronic unit 12 of the primary key 10 and the electronic unit 2 of the container 1 is illustrated by a double arrow 50. The aforesaid communication may be a  
10 wireless communication, a range limited communication and based on IR light. Communication can also be achieved by means of a temporary male-female connection between concerned electronic units.

Also shown in Fig. 1 is a second key/secondary key 20 which is designed to enable the mobile container 1 to be deactivated and/or opened in combination with a primary key 10. The illustrated secondary key 20 is encapsulated in an outer casing 21 which is equipped with an alarm system so that any type of unauthorised  
20 manipulation of the casing, such as an attempt to perforate the same or to open the same, can be indicated. Located in the key casing or encapsulation 21 is a third electronic unit 22 and also possibly a source of electric current. An attempt to perforate or to open the outer encapsulation 21 will result in the destruction  
25 of the code contained by the secondary key 20. The secondary key 20 may also be provided with an operating button 23, as shown.

The electronic unit 22 of the secondary key 20 can be loaded with codes and possibly other information through the medium of an  
30 electric socket to which programming equipment can be connected temporarily. The key 20 also includes means which enable the electronic unit 22 to communicate with the electronic unit 2 of the container 1, either directly or via the primary key 10, for example with the aid of electromagnetic waves (e.g. infrared  
35 light, so-called IR light) or a temporary electrical power connection.

The secondary key 20 includes means for communicating with the primary key 10. These communications means may consist of one or more electric conductors 28 which can be connected temporarily to the primary key 10 via a connection point 30. In addition to code communication between the key 10 and the key 20, the conductor/conductors 28 may also transmit operating current to the key 20 from the electric power source of the key 10, thereby obviating the need to provide the key 20 with its own power source.

The *modus operandi* of the inventive method is, in principle, as follows. Let us assume that a complete code-set ABCD is required to initiate deactivation and/or opening of the transportable security container 1. Because the electronic unit 12 of the primary key 10 contains a first code subset corresponding to codes AB, for instance, and because the electronic unit 22 of the secondary key 20 contains a second code subset corresponding to codes CD, for instance, the two keys 10 and 20 will together contain the full code ABCD required to initiate deactivation and/or opening of the transportable container 1. Thus, both the primary key 10 and the secondary key 20 must be used simultaneously in order to enable the container 1 to be deactivated and/or lawfully opened. It is thus necessary to obtain a code interplay and/or dialog-like communication between the keys 10 and 20. This means that the container can only be deactivated and/or opened at specified destinations or geographical positions where an accepted secondary key 20 is kept. Because the primary key 10 contains solely the code subset AB when separate from the secondary key, the loss of the primary key 10 will not constitute a risk that unlawful access to the valuable contents of the container/case can be obtained solely by means of the key 10. Thus, access to the container contents can only be achieved at the geographical positions at which the secondary key 20 is kept, at the same time as this destination is visited by a transportation responsible person in charge of the container 1 and the primary key 10. When necessary, the primary key 10 may be transported separately.

It will be understood that communication between the primary key 10 and the secondary key 20 may be a wireless and range limited communication, if so desired. For example, the secondary key 20 may be loaded with its code subset CD at a central station prior to separate distribution of said second key to its intended destination/place of use.

It will also be understood that communication between the keys 10, 20 and the security case or bag 1 may be highly advanced, involving a number of reciprocal code interchanges and code conversions. A central feature of the invention, however, is that the keys 10 and 20 share the full code-set required to initiate deactivation and/or opening of the container 1.

When the two keys 10 and 20 are coupled physically together with the container 1 in conjunction with deactivating and/or opening said container, the two keys may be supplied with electric current from the power source of container 1 if so desired.

It will be understood that many variations are possible within the scope of the invention with regard to the structural design and code contents of the keys 10, 20 and also with regard to code conversion capacity. The keys 10 and 20 may operate in series and/or in parallel.

In the case of a transportation route 100 according to Fig. 2 that includes, for instance, a transportation centre 200 and three depositing stations and/or collection stations 110, 120, 130, there may be used a container 1 which is deactivated/opened by the code ABCD at destination/position 110, and which can be deactivated/opened by the code ABEF at the destination/position 120, and which can be deactivated/opened by the code ABGH at the destination/position 130. In this regard, a secondary key 20 is pre-distributed with the code subset CD in respect of the geographic position 110, a secondary key 20 is loaded with the code subset EF in respect of the geographic position 120, and a



secondary key 20 is loaded with the code subset GH in respect of the geographic position 130, said secondary keys 20 being kept by authorised persons in a secure manner.

5 The electronic unit 2 of the container 1 is programmed for the transportation route concerned prior to transportation of the container from the central station 200 by means of a transport vehicle 300, for instance. The full code set provided by the keys 10 and 20 in combination enable the container 1 to be  
10 deactivated/opened, provided that the container and/or said vehicle 300 arrive at the correct destination within a permitted time interval. The position of the container 1 and/or the vehicle 300 can be monitored, for instance, by means of a mobile telecommunications network, GPS, or by some other appropriate  
15 position indicating method. This enables route deviations and/or time deviations to be established and remedied.

The level of security can be further heightened by successively informing the person transporting the container of the identity of  
20 one single collection station/delivery station at a time, so that solely one nearby interval (a given route selection interval) of the total transportation distance will be known to said person.

Security can also be heightened by limitation of time windows,  
25 geographic windows, maximum permitted route deviations, and so on. The choice of roads/routes and route patterns may, of course, be varied from time to time, etc. Such measures can be taken in order to make so-called insider crime more difficult to carry out.

30 For example, in order to further heighten the security level against robbery, for instance, the present invention may be supplemented with so-called real time protection, with which the container can only be opened at an intended delivery station during a specific time interval or time window. The security  
35 requirement may, of course, be adapted to correspond to risk assessments, and time requirements and position requirements may be excluded at times.

In the case of the transportation route exemplified in Fig. 2, the vehicle 300 leaves the central station 200 and delivers/collects at the geographic position 110 after travelling a route section 101, wherewith the container 1 can be opened/deactivated by means of the vehicle-carried primary key 10 containing the code subset AB in co-action with a position-stored secondary key 20 containing the code subset CD, wherewith the container 1 can be emptied and/or loaded with valuable objects, whereafter the container is shut and its alarm system activated. Transportation then continues along route section 102 to the geographic position 120, wherewith the container 1 is opened/deactivated by means of the vehicle-carried primary key 10 containing the code subset AB in co-action with the secondary key 20 containing the code subset EF and stored at position 120. Upon completion of the work required, the container 1 is again closed and its alarm system activated for continued transportation along route section 103 to the geographic position 130, wherewith the delivery/collection sequence is repeated by deactivating/opening the container 1 with the aid of the vehicle-carried primary key 10 containing the code subset AB in conjunction with the secondary key 20 containing the code subset GH and stored at the position 130. Upon completion of the work involved, the container 1 is closed and its alarm system activated, whereafter transportation is continued along a route section 104 to the central station 200, and so on.

In the case of the illustrated embodiment, the primary key 10 is programmed at the security central station 200 in respect of the customer or customers to be visited along a transportation route, wherewith the primary key 10 will normally contain a customer-specific code subset which is tied, for instance, to customer-destination security container 1. If several customers are to be visited along one and the same transportation route, a second customer may be allocated a second security container 1 co-acting with a second primary key that has a customer-specific code subset, and so on.

Respective security containers 1 thus have one single primary key that always contains the same code subset and therefore does not normally need to be reprogrammed between, for instance, mutually different transportation tasks for one and the same customer, therewith greatly facilitating handling and administration. A robbery carried out during transportation of the container will never be successful in opening the container without activating the alarm system, since only one code subset is found in the primary key 10 accompanying the transport vehicle. Lost secondary keys 20 can be blocked and replaced with another secondary key that contains a different code subset, and so on.

It will be seen that the physical construction of the primary key and the secondary key/secondary keys can be varied widely within the scope of the invention.

For example, the primary key may include GPS equipment for acceptance of opening destinations.

In a simple form, the secondary key may consist of a memory card or board, a memory wire (e.g. a so-called 1-Wire® from Maxim Integrated Products) or some other memory device which, in use, is docked with or coupled temporarily to the primary key. Such a secondary key does not require its own current supply. The serial number or manufacturing number of the secondary key may, in this case, consist of the code subset CD, etc.

As will be understood, it lies within the scope of the invention to give the primary key a simple construction and to place the complexity and/or the intelligence in the secondary key or keys. It will thus be understood that many variations are possible within the scope of the present invention.

It is also conceivable within the framework of the invention to use more than one secondary key containing one and the same code subset in regard of more than one geographical position for reasons of simplicity, although this will most often reduce the security level.

It will also be understood from the foregoing that the invention affords a very high degree of security in respect of the transportation of valuable articles, and that many variations are conceivable within the scope of the inventive concept.

The invention is therefore not limited to the illustrated and described subject matter, and that changes and modifications are conceivable within the scope of the accompanying Claims.

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## CLAIMS

1. A method pertaining to the transportation of an alarmed container, particularly with respect to the transportation of valuable objects or valuable documents for instance, wherein the container (1) includes a first electronic unit (2) which can function to accept and permit deactivation and/or opening of the container, and wherein a primary key (10) by means of which the container can be opened includes a second electronic unit (12) for communication with the first electronic unit (2) so as to initiate opening of the container, **characterised** in that a person transporting the container (1) carries the primary key (10), wherein opening and/or deactivation of the container (1) at an intended destination is effected with the aid of a code subset (AB) from said person-carried primary key (10) in co-action with a code subset (CD) from a secondary key (20) located at said intended destination, said co-action providing a complete code-set (ABCD) for initialising opening/deactivation of said container.
2. A method according to Claim 1, **characterised** in that the secondary key (20) includes a third electronic unit (22) that contains a subset (CD) of the complete code-set (ABCD) required to initiate deactivation and/or opening of the container (1).
3. A method according to Claim 1 or 2, **characterised** in that in the case of a transportation route (100) that includes a number of delivery destinations/collecting destinations (110, 120, 130) there is placed at said destinations secondary keys (20) that have mutually varying code subsets; and that said person-carried primary key (10) in co-action with code subsets (CD, EF, GH) from respective secondary keys (20) enables the container to be opened/deactivated at respective destination places (110, 120, 130) along a transportation route (100), for instance.
4. A method according to any one of Claims 1-3, **characterised** in that opening/deactivation of the container in respect of a given destination (110, 120, 130) is limited to a given time interval.

5. A method according to any one of Claims 1-4, **characterised** in that opening/deactivation of a container in respect of a given destination (110, 120, 130) is limited to a limited geographical area.

6. A method according to any one of Claims 1-5, **characterised** by blocking a lost primary key (10) and replacing the lost key with a new primary key (10) containing a new code subset, and by modifying the opening code/deactivation code of the container (1) at the same time.

7. A method according to any one of Claims 1-6, **characterised** by blocking a lost secondary key (20) and replacing said lost key with a new secondary key (20) that contains a new code subset, and by modifying the opening code/deactivation code-set of the container (1) at the same time.

8. An arrangement for carrying out the method according to any one of Claims 1-7, **characterised** in that the arrangement comprises a primary key (10) that includes an electronic unit (12) in which said code-subset is stored; and in that said electronic unit (12) is encapsulated in a first casing (11).

9. An arrangement according to Claim 8, **characterised** in that said arrangement further comprises a secondary key (20) which includes an electronic unit (22) or a memory unit for storing a code subset; and in that said electronic unit (22) or memory unit is encapsulated in a second casing (21).

10. An arrangement according to Claim 8 or 9, **characterised** in that the arrangement comprises a secondary key (20) that includes a memory unit in the form, e.g., of a memory card or a wire memory for storage of relevant code subsets, wherein e.g. the serial number of said memory unit constitutes a relevant code subset (CD, EF, GH, etc.).

11. The use of a primary key (10) and a number of secondary keys (20) in accordance with one or more of the preceding Claims, **characterised** in that the keys (10, 20) are used in conjunction with security transport to different geographical destinations.

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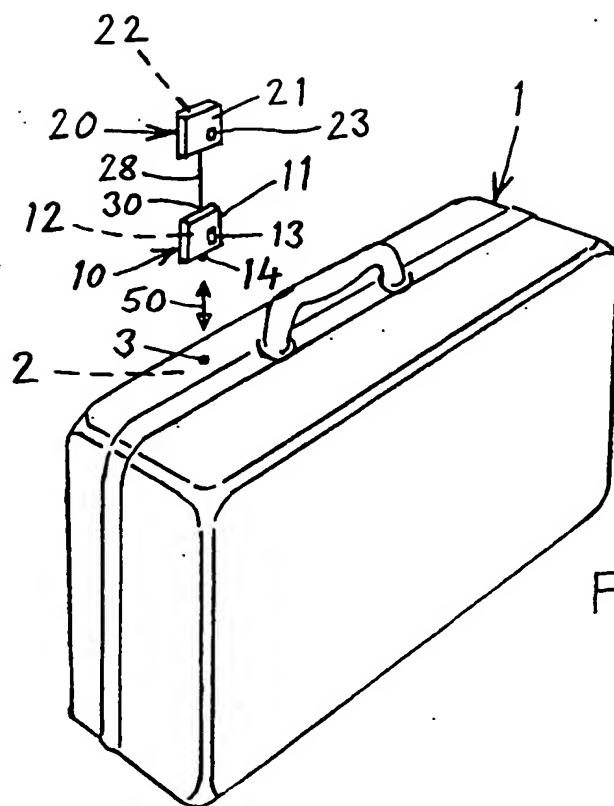


FIG. 1

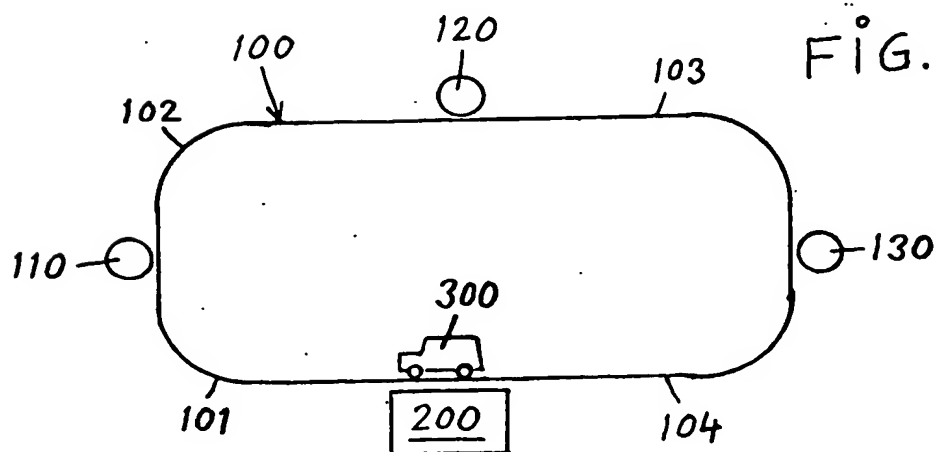


FIG. 2



# INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 03/00104

## A. CLASSIFICATION OF SUBJECT MATTER

**IPC7: E05G 1/14, G07C 9/00**

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

**IPC7: E05G, G07C**

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

**SE,DK,FI,NO classes as above**

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	US 5164718 A (S. CEDERGREN), 17 November 1992 (17.11.92) --	
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A	US 4649833 A (P.S.B. CUMMINS), 17 March 1987 (17.03.87) -- -----	

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

\* Special categories of cited documents:

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"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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Date of the actual completion of the international search

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**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

28/02/03

International application No.

PCT/SE 03/00104

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